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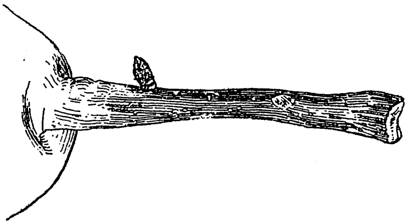
because the water is so well shaded from the sun. Upon July 20, there was a copious rain that filled all the cups, and it was five days before any marked diminution of the water was noticed. At the end of fourteen days many of the lower cups still contained water. The cups were found to contain from 300 to 600 cc. An average plant would hold about a liter, and a large plant as much as a liter and a half.

It seems more probable that the object of the cups with their water is to protect the plant from crawling insects, which it does most effectually. The blossoms are frequented by bees and other flying insects, but upon the plants are found no ants or other crawling animals. The hooked prickles so thickly set along the stems, and especially on the stem just beneath the blossoms, are a perfect barrier against snails, slugs and such soft-bodied animals, while the water keeps away the hard-bodied insects. The flowers are not well arranged for cross-fertilization by ants, as the anthers and stigmas are raised so far above the throat of the corolla that ants would not reach them easily and naturally.

It is doubtless to the advantage of the plant that such insects be kept away, as they would take the nectar and yield nothing in return.

It is perhaps worthy of notice that no bridge is thrown across this moat until the falling flowers cover the surface, and tnen it is too late for them to be injured by marauding ants.—W. J. BEAL and C. E. ST. JOHN.



Bud on a pear stem.—The Howell pear often presents a curious anomaly in bearing a well-developed bud upon its fruit stem. The accompanying cut shows such a bud borne a half inch below the base of the fruit. This singular disposition is additional proof, if any were needed, that the fruit stalk is essentially a true stem, bearing a transformed cluster of leaves.—L. H. BAILEY, JR., *Agricultural College, Mich.*

Cultivation of saccharomycetes.—Some fermentation experiments with which I was engaged during the past summer required the application of pure yeast, free from other organisms capable of producing fermentation. The methods of separation and cultivation employed were very successful, and may suggest something of value here.

A few drops of fresh beer-yeast were shaken in a test tube with sterilized gelatine, which had been melted and cooled again until it was barely fluid. This, flowed upon sterilized plates, gave in twenty-four hours, at ordinary room temperature, a great number of colonies of schizomycetes and saccharomycetes, from which, with the aid of an ordinary dissecting microscope, it was easy to inoculate new cultures. The gelatine was of the ordinary composition in daily use in the laboratory, viz.: ten per cent. gelatine, ten per cent. grape sugar, Liebig's "Fleisch Extract" added to give a yellowish brown color, and neutralized with sodium carbonate. Such a mixture is solid at 25° C.

For further culture the isolated gelatine plate colonies were inoculated into sterilized solutions consisting of an extract made by boiling 200 grams of yeast in a liter of water, filtering, and adding ten per cent. of grape sugar. In such a solution an inoculation of a few yeast cells usually increased in from twenty-four to forty-eight hours sufficiently to cover the sides and bottom of an ordinary 200 cc. flask with a thick white sediment. The cultures were most strong and active at the end of forty-eight hours. The supernatant fluid was then poured off, leaving the yeast deposit comparatively dry, twenty cc. of sterilized water added, and in this condition transfer to the sugar solution undergoing observation was easy, by means of a pipette. By this method, and the use of the extract of yeast as a nutritive solution, pure cultures were repeatedly obtained which excited as active fermentation as the fresh yeast from the breweries, a result not always obtained by the use of artificial nutritive solutions. The original gelatine plate cultures, on account of their rapid growth, were useless after thirty-six hours, and to avoid a constant renewal of the process, as well as the introduction of different species of saccharomycetes, inoculations were made into gelatine tubes. The cultures thus obtained produced characteristic, elegant, ivory-white colonies of 3-6 mm. in diameter, and then further development ceased. In this state they retained their vitality, and were constantly referred to as a source of inoculating material for two months. Probably they remained vigorous much longer, as saccharomycetes are well known to do, but at this time my need of them came to an end.

Such a dormant vegetative state might be favorable to the production of spores, which, according to the prescribed methods, I have had difficulty in obtaining. At least, for the object desired, the method given was found very convenient and successful.—W. E. Stone, *Göttingen.*

The preparation of agarics for the herbarium.—It will be generally admitted that the wretched condition of most specimens of fleshy fungi in herbaria and published exsiccatæ makes them practically worthless for purposes of comparison and identification. The purpose of this note is to call attention to a practicable process for greatly improving the quality of such specimens and so rendering them really valuable.

In 1880, G. Herpell, of St. Goar, Germany, published an account[1] of his method for the preparation of herbarium specimens of fleshy fungi, and from 1881 to 1884 issued illustrations of his method in the form of four small fascicles of Agaricini, under the title, "*Sammlung präparirter Hut-*

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[1] Das Präpariren und Einlegen der Hutpilze. Bonn, 1880.